

Claims

What is claimed is:

1. A sample for manipulation by an optical tweezer, comprising one or more target objects and one or more auxiliary objects, at least one auxiliary object being linked to at least one target object, wherein the at least one auxiliary object includes haemoglobin or a haemoglobin derivate.
2. The sample of claim 1 wherein said one or more auxiliary objects includes a haemoglobin like protein body.
3. The sample of claim 1 wherein said one or more auxiliary objects includes muscle haemoglobin.
4. The sample of claim 3 wherein said muscle haemoglobin is myoglobin.
5. The sample of claim 1 wherein said one or more auxiliary objects has a biconcave form.
6. The sample of claim 1 wherein said one or more auxiliary objects has a round form.
7. The sample of claim 1 wherein said one or more auxiliary objects has a thorn apple form.

8. The sample of claim 1 wherein said one or more auxiliary objects is a red blood cell.

9. The sample of claim 1 wherein said one or more auxiliary objects is a liposome containing haemoglobin or a haemoglobin derivate.

10. The sample of claim 1 wherein said one or more auxiliary objects is a colloidal polymer microcapsule.

11. The sample of claim 1 wherein said one or more auxiliary objects includes a coating comprising a substance, the surface charge of which is opposite the surface charge of the target object.

12. The sample of claim 11 wherein said substance includes positively charged polymers, which do not show any reactive groups.

13. The sample of claim 1 wherein said one or more auxiliary objects has a poly-ethylene-imide or poly-L-lysine coating.

14. The sample of claim 1 wherein said one or more target objects is a biological cell.

15. The sample of claim 1 wherein said one or more target objects is fixed on a carrier and said one or more auxiliary objects is fixed on said one or more target objects.

16. A method for producing optically induced mechanical forces on a target object comprising:

- providing one or more target objects;
- providing one or more auxiliary objects including haemoglobin or a haemoglobin derivate;
- linking at least one of the auxiliary objects to at least one of the target objects; and
- applying an optical tweezer to said linked auxiliary object wherein manipulation of said at least one of the target objects occurs with the application of the optical tweezer to said linked auxiliary object.

17. The method of claim 16 further comprising coating said one or more auxiliary objects, before linking, with substances which change a surface charge such that the target objects and the auxiliary objects show surface charges with differing signs.

18. The method of claim 16 wherein linking includes fixing at least one of the auxiliary objects to at least one of the target objects.

19. The method of claim 16 wherein said optical tweezer includes one or more optical beams.

20. The method of claim 16 wherein linking at least one of the auxiliary objects to at least one of the target objects includes attaching at least one of the auxiliary objects to at least one of the target objects.

21. A system for inducing optical forces for manipulating a target object, comprising:

an optical tweezer including a laser beam with a focus;

a microscope having a beam passage; and

a target object aligned with said laser beam, wherein said laser beam and said beam passage are coupled together for manipulating the target object toward said focus.

22. The system of claim 21 further comprising an auxiliary object in said laser beam path linked to said target object, wherein said auxiliary object is manipulated by said coupled beam passage and laser beam toward said focus, manipulating the target object toward said focus.

23. The system of claim 22 wherein said auxiliary object includes haemoglobin or a haemoglobin derivate.

24. The system of claim 21 wherein said optical tweezer includes multiple laser beams.

25. The system of claim 24 further comprising optical elements forming multiple laser beams.

26. The system of claim 21 wherein said laser beam is a longwave laser beam.

27. The system of claim 21 wherein said laser beam is coupled directly into said beam passage.

28. The system of claim 21 wherein said laser beam is coupled into said beam passage via a system of lenses.

29. The system of claim 21 wherein said microscope is a confocal laser scanning microscope.